



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,433	06/19/2006	Manfred Fischer	710270-038	6659
7590 Robert I. Stearns Dickinson Wright 38525 Woodward Avenue Bloomfield Hills, MI 48304-2970		EXAMINER PICKARD, ALISON K		
		ART UNIT 3676		
		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/583,433

**Applicant(s)**

FISCHER ET AL.

**Examiner**

Alison K. Pickard

**Art Unit**

3676

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10, 12 and 14-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12 and 14-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 18 is objected to because of the following informalities: Claim 18 does not depend from any claim. For purposes of examination, the examiner is considering it to depend from claim 15. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-10, 12 and 14-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Regarding claim 1, the specification does not appear to disclose that "only" a portion of the contact surface is coated with the CrN coating. The specification does not appear to disclose that the coating is "unground" and in its "as-applied" surface condition. Regarding claim 2, the specification does not disclose an embodiment with a removable cover on a ground surface. Claim 1 requires the cross member to be ground and then claim 2 further requires a removable cover on that surface. There does not appear to be any disclosure supporting this process. Claim 15, the specification does not appear to disclose that the coating is not disturbed. The claims have been examined as best understood.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7, 10, 12, 14-16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer in view of Anderson (2,905,512) in view of Ishida (5,316,321).

Beyer discloses a piston ring and method comprising a base 1 with a contact surface 3 and upper and lower side surfaces. The contact surface is provided with a coating 2. A portion of the surface is supplied with a removable cover (portion above line 12, which is removed). Once removed, a sharp edge is formed between the side and contact surface (col. 4, lines 37-38). The contact surface profile has a cross member 5. The profile is partly conical and includes a groove/undercut (near 9). Beyer does not appear to disclose that the removable cover is applied outside the contact surface or is a strip/band or that the coating is unaffected. Anderson teaches an alternate method of applying a coating to only desired locations of a piston ring. Anderson teaches that the piston ring sliding surface is first ground (see col. 3, lines 19-26). Then a maskant 36 is applied to locations where a coating should not be applied (such as at portions 5 of Beyer). The maskant is removed after the ring has been coated. The coating is unaffected and un-ground because only the maskant portion is removed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method taught by Anderson as such is known technique that would yield expected results.

Beyer also does not disclose the coating is Cr or N based and applied by vapor deposition (i.e. PVD or CVD). Ishida teaches a method of coating a piston ring. Ishida teaches that thermal spraying (of Mo, etc) is equivalent to PVD of a Cr or N based coating (see col. 5, lines 56-68). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an equivalent technique such as PVD of a Cr or N based coating to protect the piston ring.

Regarding claims 7 and 18, neither Beyer nor Ishida appear to disclose the claimed coating thickness. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the coating in the claimed thickness range.

6. Claims 8, 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer in view of Anderson in view of Ishida as applied to claims 1 and 15 above, and further in view of Iwashita.

Beyer does not appear to disclose a chrome layer on the sides of the ring. Iwashita teaches a piston ring with coatings. Iwashita teaches using a chrome layer 5 to alleviate strain. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a chrome coating on the piston ring of Beyer to improve the strength.

7. Claims 1-4, 6, 7, 10, 12, 14, 15, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takao (3,944,236) in view of Anderson in view of Ishida.

Takao discloses a method and piston ring with a base 1 having a contact surface 5 with a cross member portion 1'. A portion of the contact surface has a chrome coating<sup>4</sup> in a groove.

The surface also has undercuts 7 for an oil reservoir. Takao does not appear to disclose the chrome coating is CrN, that it is applied with vapor deposition, or the removable cover required by the claims. Anderson teaches a method of coating a piston ring. Anderson teaches that the piston ring sliding surface is first ground (see col. 3, lines 19-26). Then a maskant 36 is applied to locations where a coating should not be applied (such as at portions 1' of Takao). The maskant is removed after the ring has been coated. The coating is unaffected and un-ground because only the maskant portion is removed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method taught by Anderson as such is known technique that would yield expected results.

Ishida teaches a method of coating a piston ring. Ishida teaches vapor deposition is a known and effective method of applying a chrome coating and that CrN is a known and suitable chrome coating for piston rings. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use CrN as the chrome coating and to apply it using PVD since the use of a known element and technique to improve a similar device yields expected results.

Regarding claims 7 and 18, neither Takao nor Ishida appear to disclose the claimed coating thickness. However, it is not considered inventive to discover the optimum or workable ranges by routine experimentation absent some showing of criticality. See *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the coating in the claimed thickness range.

***Response to Arguments***

8. Applicant's arguments filed 2-2-09 have been fully considered but they are not persuasive.

As noted above, the specification does not appear to disclose that the coating is un-ground or in its "as-applied" condition. Regardless, Anderson teaches a method of coating a piston ring using a masking/removable cover to protect the surfaces the coating should not be applied to. The coating is not affected when the masking is removed. However, the examiner also submits that even if the coating were eventually ground, it would meet the claim requirements when in the stage just before being ground. The claims do not require the ring to be used with the coating being un-ground nor does there appear to be support in the specification for this. Harayama also teaches a method of applying a cover 29 to areas that a coating should not be applied. The coating is also unaffected by Harayama's method.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alison K. Pickard whose telephone number is 571-272-7062. The examiner can normally be reached on M-F (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on 571-272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alison K. Pickard/  
Primary Examiner, Art Unit 3676

AP